THURSDAY, JUNE 4, 1914.

MEDIEVAL TECHNOLOGY.

The Art of Dying. In two parts. Pp. 356. (Stratford-on-Avon: The Tapestry Studio, n.d.) Price 3*s.* 6*d.* net.

THIS is not a medical or theological disquisition on the most desirable route to Valhalla, but a reprint, in the original spelling, of a book first published in 1705, on the methods then in vogue for colouring textile materials.

It was written for the instruction "of the lovers of the Noble Art of Dying," and the "Ingenious Reader" is informed that the anonymous author was a "Jealous Votary to Physical and Experimental Knowledge" who "purchased the Receipts at a very dear Rate." By means of the book "the Candid Peruser is cheaply obliged with the Select Practical Secrets of several Nations."

In all probability the receipts here collected really represent the best practice of the times, but they now appear very quaint, and a large number of the ingredients were obviously useless. For example, a black on silk was dyed in a vat containing no fewer than twenty-one ingredients, including senna, gentian, marjoram, honey, brandy, antimony, silver, gold, verdigris, copperas, and locksmith's filings. On the other hand (p. 93), "The manner of making a Fatt and preparing hot Suds to dye Woolen blew" gives a description of setting an indigo vat, which would almost stand good for a fermentation vat of the present day.

The second part of the book gives "A Perfect Description of Pot and Weed Ashes," with instructions "how to chuse the best sorts." In this portion there is some very quaint information for the "lovers of Mathematicks" and others: *e.g.* "Take two Fatts, take them to Pieces and of the Planks make one Fatt and it will be found to make four of the other Fatts" (in capacity).

Shipwreck of the vessels in which barrels of ashes were imported was evidently a common experience, as the art of fishing up the barrels with poles made for the purpose is fully described. Possibly, however, the poles were to be borrowed from the smugglers who had frequent occasion to use them for the purpose of recovering the casks of brandy sunk on the approach of the preventive men.

The recrudescence of handcrafts is due to a healthy revolt from present-day industrial conditions and results, but nothing would really be gained, either from the artistic or the economic point of view, by reverting to the old natural colouring matters. As well might we go back to burnt swallows or desiccated snakes for our medicines. The old-world charm of the stage-coach should not prevent us from making use of the convenience of the motor car, and a refusal to make use of modern scientific products would be an unnecessary limitation of the artistic possibilities of hand-made fabrics or other materials.

The book is, however, an interesting historical record.

WALTER M. GARDNER.

TAXONOMIC ZOOLOGY.

(1) *Catalogue of the British Species of Pisidium (Recent and Fossil) in the Collections of the British Museum (Natural History).* With Notes on those of Western Europe. By B. B. Woodward. Pp. ix + 144 + xxx plates. (London: British Museum (Natural History); Longmans, Green and Co., 1913.) Price 10*s.* 6*d.*

(2) *The Coleoptera of the British Islands.* By Dr. W. Warde Fowler and H. St. J. Donisthorpe. Pp. xiii + 351 + plates. Vol. vi. (Supplement). (London: Lovell Reeve and Co., Ltd., 1913.) Price 18*s.* net.

(3) *A Revision of the Ichneumonidae.* Based on the Collection in the British Museum (Natural History). Part ii., Tribes Rhyssides, Echthromorphides, Anomalides and Paniscides. By Claude Morley. Pp. x + 140. (London: British Museum (Natural History); Longmans, Green and Co., Ltd., 1913.) Price 5*s.* 6*d.*

(4) *Catalogue of the Heads and Horns of Indian Big Game. Bequeathed by A. O. Hume, C.B., to the British Museum (Natural History).* By R. Lydekker. Pp. xvi + 45. (London: British Museum (Natural History); Longmans, Green and Co., Ltd., 1913.) Price 2*s.*

(5) *The Fauna of British India.* Including Ceylon and Burma. Hymenoptera Vol. iii., Ichneumonidæ: 1. Ichneumones Deltoidei. By Claude Morley. Pp. xxxvi + 531. (London: Taylor and Francis, 1913.) Price 20*s.*

(6) *Catalogue of the Lepidoptera Phalaenae in the British Museum.* Vol. xiii. By Sir George F. Hampson, Bart. Pp. xiv + 609 + xviii plates. (London: British Museum (Natural History); Longmans, Green and Co., Ltd., 1913.) Price 16*s.*

(1) THIS excellent monograph deserves a niche to itself; not, indeed, because of the inherent splendour of its raw material, for it embodies only the exuviæ of a few species of small fresh-water Mollusca, but by reason of its form, its style, and its finished technique. Its quality and dignity are enhanced by the fact that it takes in not only the present condition and past history

of the genus Pisidium, but also the geological relations of the British species.

All taxonomic work on fresh-water Mollusca—perhaps all taxonomy of fresh-water invertebrates—is difficult, even when no obfuscation has accrued from the fitful labours of commentators, because of the infinite little diversities of environment to which fresh-water species are exposed; but the genus Pisidium offers peculiar difficulties, on account of the small size of the shells and the obscurity of their specific features.

There can be little doubt that this fine monograph, with its critical treatment of history and synonomy, its concentrated attention upon crucial hinge characters, its graphic summaries of specific distribution, its exhaustive bibliography, and its copious wealth of figures, will make the way easy for students of the British species of the genus Pisidium. But it is doubtful whether any but an experienced veteran will appreciate the immense labour and unwearied application which this work, involving close examination of many thousands of specimens, recent and fossil, represents.

(2) The sixth volume of this important and useful work consists partly of concise descriptions—accompanied by exact records of distribution—of species added to the British list since the publication of the fifth volume in 1891, and partly of miscellaneous notes and records compiled by Mr. Donisthorpe. There is an interesting introductory chapter by the senior author, in which classification and some other matters of general interest are discussed. For classification he repeats his division of the Coleoptera into three suborders: Adephaga, Polycerata, and Lamellicornia, the Polycerata including the Staphylinoidea and five big groups (Clavicornia, Serricornia, Heteromera, Phytophaga, and Rhynchophora), which some entomologists still regard as suborders.

The species question is briefly alluded to in a few very sensible words, Dr. Fowler apparently not being addicted to the belief that species are entities that sprout into existence ready-made.

(3) In this volume the four tribes Rhyssides, Echthromorphides, Anomalides, and Paniscides are reviewed, the first two tribes being briefly characterised and the last tribe being fully defined, while the limits of the third (Anomalides) are merely indicated by the constituent genera. There are 298 species included, and these are distributed in 30 genera, 71 of the species and 8 of the genera being named and defined as new to knowledge. All the genera and species are differentiated in neat and concise, yet adequate, tables; and beyond this the limits of each genus are critically discussed, and in the case of species the synonomy and geographical distribution, and usually the salient specific attributes, are fully considered. It is a model of a revision, and the only word that can be breathed against it is that in the geographical grouping of the species of the larger genera political instead of zoological divisions of the globe are adopted—which is rather a pity, as the geographical distribution of many of the genera is very suggestive, and deserves to be emphasised. It is to be hoped that in taking this course the author has not been influenced by those extremists of the convergence school who try to flout the systematist out of his calling.

(4) A portrait and an appreciative biographical sketch of the original of this bequest—a man distinguished alike for his ardour in natural history and sport, his culture, and his generosity—take this small volume quite out of the roll of common museum catalogues.

The material catalogued includes ninety-seven picked specimens of Indian big game trophies, making a collection such as, to quote Mr. Lydekker, "it would nowadays be impossible to bring together." Every specimen is meted and appraised acording to mode. No fewer than twenty-four of them have a place in the front rank, four of these—to wit, of the Shou (*Cervus wallichi*), the Tibetan Antelope, the Himalayan Serow, and the Lahul Ibex—being "records"; while eight more—namely, of the Yak, the Bharal, the Sind Wild Goat, the Nilgri Tahr, the Blackbuck, the Yarkand Gazelle, the Yarkand Stag, and the Chital—are, severally, *proxime accesserunt.*

Modest as are its limits, the work bears the author's hall-mark.

(5) This volume, dealing with a group of insects of approved economic value, is a noteworthy addition to the fauna of British India. But if it satisfies expectations it excites them no less, since, though all the great component parts of the Ichneumon family are defined and correlated, it is only an instalment in which about half the known specific forms are arranged and described.

The author's preface, wherein he quotes with full appreciation the saying of Agassiz, that "the purpose of systematic work must be to increase our knowledge of the relationship of animals," at once inspires confidence. This confidence is strengthened by the judicious management and scholarly tone of the introductory chapter, in which a historic account of the family is followed by sections, as clear as they are concise, treating of metamorphosis, structure, and classification. After this, the author's statement that concise tabulation is very difficult, on account of the extraordinary instability of species in this family—an instability in which, among other contributing factors, cross-breeding may perhaps play a part—arouses little misgiving.

The definitions of genera, of which there are 140, and of species, of which there are 406, are polished, and can be read without fatigue, and conspicuous attributes and suggestive relations are effectively summarised. The text-figures illustrating genera are for the most part very clear and good.

(6) The construction of this monumental work goes steadily on, to the infinite honour of its author.

This thirteenth volume, of more than 600 pages, represents two subfamilies, and part of a third, of the great group Noctuidæ. The species included are of Catocalinæ 379, bringing up the total number for the subfamily to 1022, of Mominæ 74, and of Phytometrimæ 226.

The key to the Catocalinæ is reprinted from vol. xii., for convenience. This key, with its clear dichotomies for no fewer than 109 genera, as well as similar keys to the species of the larger genera, embracing some 26, some 40, and one even 101 species, enables the casual critic to form some idea of the prodigious amount of attentive labour embodied—one might almost say enshrined, when one considers that this is an ordered part of a monument *aere perennius, pyramidum altius*—in this volume.

The illustrations are on a generous scale; in addition to 455 beautiful coloured figures, in eighteen plates separately bound, there are 130 figures in the text, so that every genus is represented at least once.

SIX ESSAYS ON SEX.

(1) *Ursprung der Geschlechtsunterschiede.* By Dr. Paul Kammerer, in Fortschritte der Naturwissenschaftlichen Forschung. Herausgegeben von Prof. Emil Abderhalden. Bd. V., pp. 1–240. (Berlin and Vienna, Urban and Schwarzenberg, 1912.) Price 15 marks.

(2) *Die biologischen Grundlagen der sekundären Geschlechtscharaktere.* By Dr. J. Tandler and Dr. S. Grosz. Pp. 169. (Berlin: Julius Springer, 1913.) Price 8 marks.

(3) *Sex Antagonism.* By Walter Heape. Pp. 217. (London: Constable and Co., Ltd., 1913.) Price 7*s.* 6*d.* net.

(4) *The Nature and Origin of Secondary Sex Characters.* By F. W. Ash. Trans. North Staffordshire Field Club. xlvii. (1913), pp. 79–93.

(5) *Les Problèmes de la Sexualité.* By Prof. Maurice Caullery. Pp. 332. (Paris: Ernest Flammarion, 1913.) Price 3.50 francs.

(6) *Heredity and Sex.* By Prof. T. H. Morgan. Pp. ix + 282. (New York: Columbia University Press; London: Oxford University Press, 1913.) Price 7*s.* 6*d.* net.

(1) DR. KAMMERER has made all students of the biology of sex his debtors by taking a scholarly and critical survey of most of the recent contributions to the subject, and of the experimental work in particular. His treatise is a model of fairness and thoroughness, and must have involved a prodigious industry. He deals with the determination of sex, the theories of sex dimorphism, the results of experiments in castration, regeneration, transplantation, breeding, and environmental influence, and at very considerable length with the recent work on the internal secretions of the reproductive organs. The bibliography occupies twenty-three pages of small type! An attempt may be made to indicate Kammerer's general conclusions. The first important step in the evolution of sexual reproduction was the specialising of germ-cells as distinguished from body-cells. The second was the differentiation of macrogametes and microgametes, which are contrasted in their assimilation capacities, amount of cytoplasm, size, and activity. The factors that condition maleness ("mikrogametismus") or femaleness ("makrogametismus") are ultimately assimilation differences—the thesis, it may be recalled, of "The Evolution of Sex" (1889), to which no reference is made in text or bibliography. The differentiation of sex doubtless occurred very early in phylogeny, and the determination of sex occurs correspondingly early in ontogeny. During maturation the gametes are probably in varying degrees susceptible to environmental influence, so that their predisposition to one sex or the other may be changed, but the higher the animal the less is its susceptibility. Only in plants and in the lower animals can we now succeed in experimentally changing the progamic predisposition, activating the tendency which should otherwise remain latent.

Removal of the essential gonads changes the metabolism of the body, and is usually followed by a degeneration of the subsidiary sex characters. But it is practically impossible to draw a definite line between sex characters and body characters. It seems as though the body were "sexed" through and through. The castration, however early, never prevents the appearance of the embryonic primordium of any character; it merely exerts a quantitative influence on the development. When the essential gonadial substances are introduced by transplantation or injection into a castrated animal, the effects of castration are alleviated or reversed, and what can be done with ovarian sub-